

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 9175-18 (1987): Rationalized Steels for Automobile and Ancillary Industry, Mechanical and Physical Properties - Part 18 15Cr3 Grade steel [MTD 16: Alloy Steels and Forgings]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard

**SPECIFICATION FOR
RATIONALIZED STEELS FOR
THE AUTOMOBILE AND ANCILLARY
INDUSTRY**

**PART 18 MECHANICAL AND PHYSICAL PROPERTIES
OF 15Cr3 GRADE STEEL**

UDC 669.14 : 006.015.2 : 629.113

© Copyright 1988

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR RATIONALIZED STEELS FOR THE AUTOMOBILE AND ANCILLARY INDUSTRY

PART 18 MECHANICAL AND PHYSICAL PROPERTIES OF 15Cr3 GRADE STEEL

Co-ordinating Committee on Materials for Automobiles, SMDC 31

Chairman

Representing

SHRI C. V. TIKEKAR

Tata Engineering & Locomotive Co Ltd, Jamshedpur

Members

SHRI A. K. ROY (*Alternate to*
Shri C. V. Tikekar)

SHRI V. P. AGRAWAL

Steel Authority of India Ltd (Rourkela Steel
Plant), Rourkela

SHRI A. K. MALHOTRA (*Alternate*)

SHRI R. BHANDARI

All India Automobile and Ancillary Industries
Association, Bombay

SHRI S. PANIKAR (*Alternate*)

SHRI R. BHATTACHARYYA

Guest Keen Williams Ltd, Calcutta
Premier Automobiles Ltd, Bombay

SHRI A. T. BORATE

SHRI J. M. SHAH (*Alternate*)

SHRI R. R. CONTRACTOR

Automobile Product of India Ltd, Bombay

SHRI V. A. RAJAMONEY (*Alternate*)

SHRI S. P. DEY

Hindustan Motors Ltd, Uttarpara
Lucas TVS Ltd, Madras

SHRI V. C. GUPTA

SHRI S. C. GUPTA

The Tata Iron & Steel Co Ltd, Jamshedpur

DR A. N. MITRA (*Alternate*)

SHRI H. A. JAISINGHANI

Mahindra and Mahindra Ltd, Bombay

SHRI S. RAMACHANDRAN (*Alternate*)

SHRI R. C. JHA

Steel Authority of India Ltd (Alloy Steel Plant),
Durgapur

SHRI R. C. MODI (*Alternate*)

SHRI M. L. KATYAL

Bajaj Auto Limited, Pune

SHRI S. R. SALGIA (*Alternate*)

(*Continued on page 2*)

© Copyright 1988

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
SHRI S. S. LAKHUNDI	Bharat Forge Co Ltd, Pune
DR M. K. S. CHERUKURUN (<i>Alternate</i>)	
SHRI S. C. MAHINDRU	Chief Inspectorate of Heavy Vehicles, Avadi
SHRI P. SOMASUNDRAM (<i>Alternate</i>)	
COL P. M. MENON	Directorate of Standardization (DGI), New Delhi
DR V. PANDURANGA	Tractors and Farm Equipment Ltd, Madras
SHRI T. K. SUBBARAYAN (<i>Alternate</i>)	
SHRI K. PARTHASARTHY	Ashok Leyland Ltd, Madras
SHRI T. S. SUDARSHAN (<i>Alternate</i>)	
DR P. G. PATANKAR	Central Institute of Road Transport, Pune
SHRI L. SHANTARAM (<i>Alternate</i>)	
DR R. V. PATHY	Mahindra Ugine Steel Co Ltd, Bombay
SHRI R. N. SINGH (<i>Alternate</i>)	
SHRI C. R. PRAKASH	Visvesvarya Iron & Steel Ltd, Bhadravati
SHRI B. HARIDASACHAR (<i>Alternate</i>)	
SHRI R. RAGHAVAN	Enfield India Ltd, Tiruvottiyur
SHRI T. M. BALARAMAN (<i>Alternate</i>)	
SHRI AJAY KUMAR RAMAN	Escorts Ltd, Faridabad
SHRI S. D. KHANNA (<i>Alternate</i>)	
DR V. RAMASWAMY	Steel Authority of India Ltd (R & D Centre for Iron and Steel), Ranchi
SHRI S. R. MEDIRATTA (<i>Alternate</i>)	
SHRI C. V. K. MURTHY RAO	Association of Indian Automobile Manufacturers, Bombay
SHRI S. P. RAO	WG Forge and Allied Industries Ltd, Thane
SHRI B. K. ANANTHARAMIAH (<i>Alternate</i>)	
SHRI ANANTHA REDDY	Nagarjuna Steels Ltd, Hyderabad
SHRI J. SRINIVAS (<i>Alternate</i>)	
REPRESENTATIVE	Ministry of Defence (DGI), New Delhi
REPRESENTATIVE	Automotive Research Association of India, Pune
SHRI A. S. SAUND	Saund Zweired Union (I) Ltd, Gwalior
SHRI B. S. SAUND (<i>Alternate</i>)	
SHRI K. SHANKARANARAYANAN	Directorate General of Technical Development, New Delhi
SHRI S. K. SHARMA	Ministry of Industrial Development , New Delhi
SHRI T. R. SEHGAL (<i>Alternate</i>)	
SHRI A. R. SONALKAR	Mahindra and Mahindra Ltd, Bombay
SHRI A. R. JANIKA (<i>Alternate</i>)	
SHRI L. SRINIVASAMADHYAN	Standard Motor Products of India Ltd, Madras
SHRI K. RANGANATHAN (<i>Alternate</i>)	
SHRI M. S. GANAPATHY SUBRAMANIAM	Mopeds (India) Ltd, Tirupathi
SHRI A. G. NAMMALVAR (<i>Alternate</i>)	
SHRI S. TIWARI	Directorate General Ordnance Factories, Calcutta
SHRI G. N. ROY (<i>Alternate</i>)	
SHRI K. RAGHAVENDRAN,	Director General, BIS (<i>Ex-officio Member</i>)
Director (Struc & Met)	

Secretary

SHRI B. K. MUKHOPADHAYAY
Deputy Director (Metals), BIS

(Continued on page 5)

Indian Standard
**SPECIFICATION FOR
RATIONALIZED STEELS FOR
THE AUTOMOBILE AND ANCILLARY
INDUSTRY**

**PART 18 MECHANICAL AND PHYSICAL PROPERTIES
OF 15Cr3 GRADE STEEL**

0. FOREWORD

0.1 This Indian Standard (Part 18) was adopted by the Bureau of Indian Standards on 25 September 1987, after the draft finalized by the Co-ordinating Committee on Materials for Automobiles had been approved by the Structural and Metals Division Council.

0.2 Part 1 of this standard was published in 1979 which covers the chemical composition of 33 rationalized steels. The mechanical properties, hardenability and isothermal transformation characteristics of these 33 rationalized steels are being covered in different parts of this standard (Parts 2 to 34). The data concerning these properties given in this standard is only for guidance and information purposes.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 18) covers the chemical composition and mechanical properties of 15Cr3 grade of steel for use by automobile and ancillary industry.

*Rules for rounding off numerical values (revised).

2. CHEMICAL COMPOSITION

2.1 The chemical composition of this grade of steel shall be as given below:

<i>Constituents, Percent</i>					
C	Si	Mn	Cr	S	P
0.12-0.18	0.10-0.35	0.40-0.60	0.50-0.80	0.035, <i>Max</i>	0.035, <i>Max</i>

3. HARDNESS

3.1 The maximum hardness for this grade of steel delivered in the as rolled condition when determined in accordance with IS : 1500-1983* shall be 185 HB.

4. MECHANICAL PROPERTIES

4.1 The mechanical properties of this grade of steel in blank carburized and hardened condition when determined in accordance with IS : 1598-1977† and IS : 1608-1972‡ shall be as given below:

i) Tensile strength, MPa	590
ii) Elongation min gauge length	13
5.65 $\sqrt{S_0}$, <i>Min</i> , percent	
iii) Izod impact value, Joules, <i>Min</i>	48
iv) Limiting ruling section, mm	30

5. HEAT TREATMENT TEMPERATURES

5.1 Forging/rolling temperature	1 200°C
Normalising temperature	880-930°C
Process annealing temperature	630-670°C
Carburizing temperature	880-930°C
Refining temperature	870-900°C
Hardening temperature	760-780°C

*Method for Brinell hardness test for metallic materials (*second revision*).

†Method for Izod impact test of metals (*first revision*).

‡Method for tensile testing of steel products (*first revision*).

(Continued from page 2)

Panel to Collect Data on Steel for Automobile Purpose, SMDC 31 : P12

Convener

DR R. V. PATHY

Representing

Mahindra Ugine Steel Co Ltd, Khopoli

Members

SHRI R. NARAYANAN (*Alternate to*

Dr R. V. Pathy)

SHRI B. K. ANANTHARAMAIAH

WG Forge and Allied Industries Ltd, Thane

SHRI O. B. DIAS (*Alternate*)

PROF R. C. CHATURVEDI

Indian Institute of Technology, Bombay

SHRI B. HARIDASACHAR

Visvesvaraya Iron and Steel Ltd, Bhadravati

SHRI D. P. VERNEKAR (*Alternate*)

SHRI H. A. JAISINGHANI

Mahindra & Mahindra Ltd, Bombay

SHRI M. G. LAWATE

The Tata Engineering & Locomotive Co Ltd, Pune

DR V. RAMASWAMY

Steel Authority of India Ltd (R & D Centre for
Iron and Steel), Ranchi

SHRI S. R. MEDIRATTA (*Alternate*)

REPRESENTATIVE

Automobile Products of India Ltd, Bombay

DR K. R. SATYANARAYANAN

College of Engineers, Pune

DR R. D. CHAUDHARI (*Alternate*)

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²